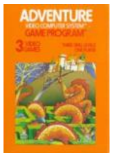


GAM0183 Game Programming

Laboratory 9

The aim of this laboratory to probe the gameplay of a basic 2-D vector-based Java game: BaseVectorShape.java Ship.java Bullet.java Asteroid.java Asteroids.java. You will make changes to the code and discover what makes for better or worse gameplay.

Micro-games last several seconds rather than several minutes. After making a change, can the player avoid and shoot down asteroids for at least 30 seconds (CT, Clock Time)?

Make all changes to the code independently i.e. reset the code to the original version each time. In what follows, normal play is when a player avoids being hit by asteroids – moving and firing. A 'gestalt' play is defined as when the player does not move from the starting position but rotates and fires as fast as possible.

Have your work checked by the teacher after every change.

"30 second" changes

1. Increase the number of asteroids (originally 20). At which number of asteroids does it become impossible to play the game for at least 30 seconds?

   ANSWER:

2. Increase the size of a bullet (originally 1x1). Increase the size of both the bullet´s shape and its collision box. At what size does it become impossible to play the game for at least 30 seconds?

   ANSWER:

3. Increase the size of the ship. (Create a local int variable called scale to multiply the (x,y) points of the polygon.) Do not increase the size of the collision box. At what scale factor does it become impossible to play the game for at least 30 seconds?

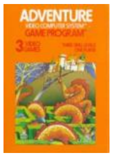
   ANSWER:

4. Increase the size of the ship´s collision box. (Create a local int variable called scale to multiply the -6s and 12s.) At what scale factor does it become impossible to play the game for at least 30 seconds?

   ANSWER:

5. With Thread.sleep(20) the target frame-rate is 50 fps. Slow the frame-rate down. At what value for the sleep parameter does it become impossible to shoot an asteroid within 30 seconds?

   ANSWER:



6. With Thread.sleep(20) the target frame-rate is 50 fps. Speed up the frame-rate. At what value for the sleep parameter does it become impossible to play the game for at least 30 seconds?

   ANSWER:

7. A gameplay gestalt is to continue to turn and fire as fast as possible. Increase the amount a ship rotates each move. (Create a local int variable called scale to multiply the basic 5 degree rotation.) At what scale factor does it become impossible to play the gestalt for at least 30 seconds? (You need only change the code for one direction of rotation.)

   ANSWER:

8. A gameplay gestalt is to continue to turn and fire as fast as possible. Increase the number of bullets (originally 10). At which number of bullets does it become impossible to play the gestalt for at least 30 seconds?

   ANSWER:

9. A gameplay gestalt is to continue to turn and fire as fast as possible. Increase the speed of the bullets. (Create a local int variable called scale to multiply the basic *2 multiplier in calls to setVelX and setVelY.) At what scale factor does it become impossible to play the gestalt for at least 30 seconds?

   ANSWER:

10. Suppose a programmer makes the mistake of using sin in calcAngleMovX and cos in calcAngleMovY. Is it still possible to play the game for at least 30 seconds without the ship hitting an asteroid?

    ANSWER:

Other Changes

11. Instead of firing bullets, the ship lays mines. Change the code so that when a bullet is created it has no velocity in either X and Y. Is it possible to lay 10 mines in a protective pattern around the ship in under 30 seconds without the ship being first struck by an asteroid?

    ANSWER:

12. Increase the number of bullets to 100 and allow the bullets to wrap-around the screen. How quickly can you destroy all 20 asteroids?

    ANSWER: